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ABSTRACT

Papers on geography and map libraries and a paper on European access to biomedical databases, which were presented at the 1983 International Federation of Library Associations (IFLA) conference, include: (1) "History and Current Status of the Globe Museum of the Austrian National Library" by Franz Wawrik (Austria); (2) "Earth Science Products for Tomorrow's Libraries," in which Gary W. North (United States) outlines the history of mapmaking and developments in satellite imagery, digital cartography, earth science computerized image processing, and microfilm, videodisk, and optical disk storage of earth science images and information; (3) "Influence des Nouveaux Types de Documents Cartographiques sur la Politique d'Acquisition d'une Cartothèque Nationale (Acquisition Policy for a National Map Library)," in which Edwige Archier (France--paper in French) describes the acquisition of maps, aerial photographs, and satellite images at the National Library and other French information centers and the need for a national policy to coordinate map acquisition activities; (4) "British Map Collections: Cooperative Planning and Projects," in which Helen Wallis (United Kingdom) describes the activities of the British Committee for Map Information and Catalogue Systems, progress toward developing a United Kingdom (UK) Machine Readable Cataloging (MARC) format for maps, the MAPLIB information retrieval system, and other cooperative projects; and (5) "Le Réseau EURONET et l'Accès aux Bases de Données Biomedicales (The EURONET Network and Access to Biomedical Databases)," in which H. F. Alfred Cordoliani (France--paper in French) describes the EURONET-DIANE packet switching network and the biomedical databases available via EURONET, PRESTEL (British videotex), TRANSPAC (French videotex) and BILDSCHIRMTEXT (German videotex). (ESR)

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IFLA

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HISTORY AND CURRENT STATUS OF THE GLOBE MUSEUM
OF THE AUSTRIAN NATIONAL LIBRARY

by

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In Vienna globes were manufactured and collected relatively early. The first globe manufacturer probably was the Dominican monk Hans Dorn (1430-1509) ¹⁾. In 1480 he created that celestial globe of 39,5 cm diameter which now is kept at the library of the Jagellonian University in Cracow ²⁾; furthermore he made a pair of globes with which - according to Bernleithner ³⁾ - the wellknown humanist Conrad Celtis made his lecture "On Ptolemean Geography" more lucid.

The first globe to be kept in the Imperial Library came from Martin Furtenbach - as far as we know - and was dedicated to the Augsburg merchant Raimund Fugger. Having been exhibited in the Fugger castle Kirchberg since 1535 it turned up in Vienna in the 17th century but has been lost again since 1734, that is to say there are no records of it after 1756 ⁴⁾. The globe was made of gilded copper, excellently engraved and decorated with numerous figures. As the stand a figure of Atlas was used who kept a compass in his right hand. Ernst Zinner was of the opinion that it had been an armillary sphere. Following the description, however, it could have been a complicated instrument, with a globe in its centre.

In 1693 Vincenzo Coronelli (1650-1718) probably the most significant globemaker of all times, presented Leopold I. a splendid pair of his 110 cm globes who in return for his truly princely gift gave him a valuable clock which is now kept in the Franciscan Monastery in Assisi ⁵⁾. The pair of globes was at first set up at the imperial country seat "Favorita" (now 4th district of Vienna, at the place of today's Theresianum), but was transferred to the Prunksaal - the Baroque reading room - of the Imperial Library after the completion of the latter in 1726 where it still can be admired. The terrestrial globe shows instead of the usual dedication to Cardinal d'Estrees a handwritten glorification and a painted portrait of Leopold I. The architect of the Baroque Court Library, Johann Fischer von Erlach, had two allegorical groups of figures put up above both side wings of the main facade facing Josefsplatz. They represent: to the left Atlas with the celestial globe, flanked by astronomy and astrology, to the right the

earth goddess G a with the terrestrial globe, surrounded by geometry and geography. The statues were created by the Vicentian artist Lorenzo Mattielli ⁶⁾. Both globes were made of copper and correspond in their size of about 3,80 m diameter with the Marly globes of Coronelli ⁷⁾. Unfortunately no map drawings can be recognized any more on either of them.

The second pair of globes by Coronelli, of 110 cm diameter which nowadays is shown in the Prunksaal of the Austrian National Library, dates back to Franz Stephan von Lothringen, husband of Maria Theresia and Roman-German emperor between 1745 and 1765, one of the most significant promoters and friends of the sciences. He had brought it with several other globes and armillary spheres (as well as with numerous physical instruments) from Lun ville to Vienna where he furnished his own physical cabinet ⁸⁾. After his death at least the large globes were transferred to the Imperial Library because they constituted an attractive supplement to the pair already placed there. At that time the Prunksaal also housed a pair of Blaeu globes of 68 cm diameter, as can be seen on old engravings. Perhaps a pair of Blaeu globes of 34 cm diameter stems from Franz Stephan, too.

A considerable augmentation of the collection seems to have occurred after the prohibition of the Jesuit order (1773) and a second one when Joseph II. disbanded a great number of monasteries. At that time probably the two interesting wooden armillary spheres of the Jesuit brother Andreas Spitzer (1719-91) were obtained.

However, globes were not collected systematically then, but rather they were received accidentally. They did not go well with the other items of the library, which at the Baroque period had to be - if at all - more interested in spectacular large globes.

The first intentional purchase known to us dates back to 1875 when the library succeeded in purchasing a pair of globes by Gerard Mercator. At that time the Viennese librarians thought them to be unique although the Gentian segments had become known already six years earlier. But despite of that this was a remarkable acquisition.

At the beginning of the 20th century, around 1905, the Map Collection of the Court Library was established, which in the beginning was only adjudged the printed maps of the Collection of Copperplate Engravings (Kupferstichsammlung) and was housed in a single room. So there was an acute lack of space from the very beginning and the concentration of the in the meantime well increased stock of globes in the Map Collection was out of question; the globes remained scattered in the different places of the library. Besides the Prunksaal there were also globes in the room of the "Präfekt" - as the head of the library was called then. After World War I the Map Collection received large new stocks when taking over the cartographic objects of the Habsburg Fidei-Kommiß Library, the Graphical Collection Albertina and - only partly of the former Institute of Military Geography. Among these acquisitions there were also globes - especially from the 19th century, such as objects dedicated to the emperor.

The interest of the learned public was roused by the publication of Edward Luther Stevenson, the keeper of the Hispanic Society,⁹⁾ the two volumes are so far considered the unsurpassed standard work on the history of globes. Since the American scholar has - with very few exceptions - omitted the Austrian collection, Eugen Oberhummer, a Munich born professor of geography at Vienna university (1859 - 1944), introduced at least the most important Viennese globes in a short treatise.¹⁰⁾ Since the beginning of the 1920's he had become more and more interested in old globes. Through his writings Oberhummer influenced the Viennese technician Dipl. Ing. Robert Haardt (1884 - 1962) who since 1930 occupied himself with the problem of globes without an axis. Haardt propagated his invention, the Haardt Roll Globe (Haardtscher Rollglobus) for the first time in 1936 in his writing "Messe die Welt" (Measure the World)¹¹⁾, later even in several geographical congresses. The idea was taken up by Ernst Bernleithner¹²⁾ and other pedagogues and actually realised by globe manufacturers, such as Columbus Publishers and more recently in a modified form by Scan-Globes.¹³⁾

Haardt also became interested in old globes and suggested in this connection to the president of the Austrian Academy of Sciences, the historian Oswald Redlich, to install a globe museum within the National Library in Vienna ¹⁴⁾. At the same time he attempted to establish a world wide inventory of old globes, that is those manufactured before 1850 - as can be seen from his voluminous correspondence which so far has not yet been fully attended to. World War II did not allow the realisation of his plan for the time being; but Haardt started to store globes of the public collections which were threatened to get damaged by bombings in his own private apartment. At that very address in the 4th district of Vienna, Gußhausstraße 20, he founded a provisional private globe museum with the support of the Ministry of Education right after the war. Haardt was appointed honorary head of the museum. He succeeded in buying globes with the help of state subsidies or he received them as a lending from public institutions, so f.i. from the University Library and the College of Veterinary Science. Haardt was assisted in all these endeavours by the geographer Hugo Hassinger who had strong historic interests. Ever since the founding of the museum there was the wish to find a final location for it, last but not least because of the limited space at the apartment for an ever growing collection. The most varied institutions were taken into consideration: a future "House of Geography" (in which the Geographical Society and the globe museum should be housed - which however has never been erected) the Geographical Society and the War Archives. Since 1946 there were also negotiations with the Austrian National Library ¹⁵⁾ but only in 1953 the Ministry of Education made a positive decision ¹⁶⁾.

The transfer of the stocks of the private globe museum to the Map Collection ensued between April 24 and June 5, 1954. There were 24 globes, 1 folding globe, 51 volumes of literature pertaining to the subject, 1 manuscript, 13 map series and numerous photographs; all in all around 700 items. Among them there were such extraordinary ones as a terrestrial and celestial globe by Mercator whose map drawings had been changed by an unknown mapmaker through over pasting and over painting in 1807. At the end of 1954 the collection

counted 62 globes. It was placed in the hall hithertoused for the collection of papyri, such being in immediate vicinity of the Map Collection. One serious disadvantage, however, was that access to the museum for visitors was only possible via the rooms of the Map Collection. Only in 1967 the museum moved to a more suitably located hall. The globe museum was looked after by the personnel of the Map Collection.

The proper opening of the exhibition took place on April 28, 1956. During the following years the numerous damaged globes got gradually repaired.¹⁷⁾ This was executed mainly by the Institute for Restoration at the Austrian National Library, but also by the School of Restoring at the Austrian Academy of Fine Arts and the Bundesgewerbeschule (State Professional School) in Vienna (1st district). Even a wood sculptor joined in restoring some of the stands. More than twenty objects were repaired in these early years. At the same time the officials in charge tried to augment the stocks through purchases and donations. In 1962, the University Library ceded 9 of their globes to the museum, six of which had been - as mentioned above - in Haardt's apartment. The most valuable object was a globe clock made of brass in 1624 by Daniel Schreyrer a watchmaker working in Steyr, Upper Austria.

In 1962 Dipl. Ing. Robert Haardt died unexpectedly. Due to his indefatigable work and his idealistic enthusiasm Vienna had become the world centre of globe research; not only through the museum but above all through the foundation of the "Coronelli Weltbund der Globusfreunde (Coronelli World League for the Friends of Globes), Latin name "Societas Coronelliana amicorum globorum" on June 11, 1952¹⁸⁾ which was initiated by Haardt. The main goals of the society were (and to a large extent still are) the catalogueing of all old globes around the world, the promoting of the use of globes in school teaching and the support of the globe museum.¹⁹⁾

Already in 1952 the first number of the magazine "Der Globusfreund" (Friend of the Globes) edited by the World League appeared; so far 31 numbers in 22 volumes have appeared. Since 1963 there have been five symposiums at irregular intervals and different European cities.²⁰⁾ The symposiums of 1963 and 1979 were held in Vienna, where

especially the Austrian National Library functioned as a meeting place. At the same time there was a special exhibition "Old globes from five Austrian private collections", in which 70 objects were exhibited.²¹⁾ Finally last fall the "Internationale Gesellschaft für Globen- und Instrumentenkunde" (International Society for the Study of Globes and Instruments) - as the World League calls itself now²²⁾ - organized on the occasion of its thirtieth anniversary a further exhibition in the anteroom to the main reading room of the Austrian National Library, "Globes dating back to the time of our great grandfathers. Jan Felkl and his contemporaries."²³⁾ Here for the first time globes from 1850 to 1920 - which so far had not yet found any special attention - were analysed. The globe museum always takes part in these activities and is always represented in the board of the Society by members of the personnel of the Map Collection. There has always been good cooperation between the two institutions but it can be called excellent now with Rudolf Schmidt being the president of the Society.

At present the globe museum of the Austrian National Library consists of 143 exhibited objects, that is 97 terrestrial globes, 33 celestial globes, 6 armillary spheres, 3 lunar globes, 1 Mars globe, 1 induction globe, 1 merameter, that is an instrument for deciding the length of day and night. It follows from the organization of the whole library that pertinent stocks are to be found also in the Map Collection and in the Collection of Printed Materials. Among them are first of all globe gores, which are either single sheets or bound in atlases, as those by Giovanni Maria Cassini, Georg Christoph Eimmart or Heinrich Scherer. 50 lending objects must be added to the above figures which come from Austrian and foreign private owners or institutions. To this group belong the terrestrial globe by Rainer Gemma Frisius, a unique object, the oldest globe to be found in Austria and the whole special collection "Lunar and Mars globes" the most voluminous of its kind existing. It was lent to us by its owner, the German cartographer Karl Heinz Meine. The globe museum and the historian of globes is mainly interested in globes dating back before 1850 - although recent tendencies in research show an interest in globes of later dates. The year 1850 is considered a kind of dividing line for "old globes" because of the difference in manufacturing, in printing techniques

and the artistic design.

Of "old globes" the museum owns 53 terrestrial, 30 celestial globes, 5 armillary spheres; altogether 88 items and is such - after the National Maritime Museum in Greenwich - the second largest collection of its kind in the world.

But it also belongs to the very few large collections where nearly all objects are exhibited. Exceptions are among others a small terrestrial globe by Daniel Friedrich Sotzmann (1754-1840) which is in the office of the General Director of the Austrian National Library, and the different globe gores; the four large Coronelli globes still decorate the Prunksaal. The Vienna globe museum is probably the only collection whose objects are put up in chronological order thus giving the visitor a general idea about the development of globe manufacturing. Although due to lack of staff it has so far only been possible to open the exhibition from Monday to Friday between 11 and 12 a.m., there are about 1000 visitors annually. We try to make up for these short visiting hours by giving special guidings upon advance announcement, trying to meet personal wishes of the visitors. So there are about 60 extra guidings every year.

During the last years we put the main accent on the protection of the objects and purchased showcases, one for several small globes and hemispheres which rest on the horizontal rings, for larger globes. The showcases are made of transparent acrylic glass and offer effective protection against dust and damage.

A further problem is catalogueing. So far there is only an internally used catalogue of slips - arranged according to authors and years of manufacturing or publication. For parts of the stocks there exist already published catalogues, that is for lunar and Mars globes ²⁴⁾ as well as for the globes made between 1850 and 1920 ²⁵⁾. I myself have been working - with several interruptions - for some years on a documentation of the globes made before 1850, about in the same way as executed by Werner Horn for the globes of Gotha ²⁶⁾ and I hope to finish it soon. Probably the documentation will be published either by the Austrian National Library or as a separate number of the "Globusfreund". It is my wish that every

object is shown at least with one picture. But that will certainly be a financial problem.

In cooperation with the Institute of Reprography the Austrian National Library intends to have the globes photographed with the means of polarisation filters, so that the pictures on the globes can be seen without disturbing reflexes. In this connection the successful attempts should be mentioned to photographically flatten the curved surface of the globe and to such regain the original globe gores. The method ordered by the Map Collection at the Institute of Photogrammetry at the Technical University Vienna seems to be very promising for the future - despite its present high costs ²⁷⁾. As a result of the pilot project we have received faultless globe gores from one of our 68 cm Blaeu terrestrial globes. I briefly talked about this method which has become possible through electronic data processing at the LIBER-conference for map librarians in Paris in 1980 ²⁸⁾. Regarding the future location of the museum there is one ray of hope, since the promised extension of the Map Collection which is overdue includes a new larger location for the globe museum as well. Such the housing problem would be solved for a long time to come.

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Division: Special Libraries

Section: Geography and Map

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Earth Science Products for Tomorrow's Libraries

by

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History

Four thousand years ago, someone in Mesopotamia scratched out a map on a clay tablet and thus created the world's first piece of earth science data--a map. Photocopies and replicas of this map exist in hundreds of libraries around the world. Over the centuries, cartographers became the illustrators for the earth sciences. The continents took on a more accurate appearance with each new mission of exploration and quest. In addition, their priceless maps tell hundreds of stories. Elaborate illustrations on the cartouche and collars of these maps depict the flora and fauna of the regions along with geographic information. Cultural practices, social customs, clothing, myths and legends are also depicted in various ways.

As papers, inks, and skills improved, more and more earth science data were added to these maps. Topography and hydrography became important, as did prevailing winds, ocean currents, and geologic barriers like canyons, cliffs, and volcanoes.

As varied in detail as these products became, however, their basic form was the same for over 1,800 years. All products started as sketches or drawings on stone, papyrus, vellum, wood, cloth, or some form of paper. Cartographers travelled with armies and explorers and brought back these records of what they saw for others to study and use. And thanks to libraries around the world, many of their original manuscripts survive for us to see today. Stacked or rolled; folded or bound; they were protected, filed, and retrieved when necessary. Hand-drawn copies were sold and traded, and often during this process, the later cartographer added newer information or corrected errors made on the initial manuscripts. This then was the state-of-the-art until 1822 when Joseph Nicéphore Niepce took the world's first photograph in France. The German physician, Johann Heinrich Schulze, had discovered in 1725 that direct sunlight blackened a mixture of chalk, nitric acid, and dissolved silver. It did not occur to him however, to experiment with how to form a permanent image. [1]

With the development of photography, man had a much quicker way of recording the physical environment except for one basic problem--he couldn't seem to get high enough in the air to get a synoptic view. Then, of course, came the balloon, and in 1858 another Frenchman named Gaspard Felix Tournachon (also known as Nadar) photographed a village from the basket of a balloon and aerial photography was born. With the invention of the airplane in the early 1900's, a more stable, steerable, airborne platform was devised to collect aerial photographs of the Earth.

With the introduction of photogrammetry in the 1930's, mapping and the use of aerial photographs became inseparable. Morris M. Thompson, in his book entitled, "Maps for America," summarizes our most recent technological developments in mapping by saying:

"Following World War II, the development of photogrammetric practices by the Survey continued at an ever-increasing pace. The multiplex system was superseded by a succession of improved plotting instruments; the Kelsh plotter, the ER-55 plotter, and various instruments of Swiss, German, and Italian manufacture. The emergence of powerful computer systems led to a revolution in photogrammetric methods for analytically extending survey control, which had been performed by an optical-mechanical analog system. The development by the Survey of the concept of orthophotography and the successful building of a practical orthophoto-scope led to the wide-spread use of a new kind of cartographic product: the orthophotographic map. . . . New techniques utilizing electronic image correlation for the automation of photogrammetric operations. . . and the digitizing of data made possible the production of cartographic data in numerical form--the digital terrain model. The application of space technology to mapping has resulted in the production of useful small-scale cartographic products from remote-sensing data obtained via space vehicle." [2]

Landsat

Today's technological world is certainly having an impact on the form that these earth science materials are taking and in how libraries must deal with the new product forms. A good illustration of this impact is the multitude of new products generated by NASA's Landsat series of Earth resources satellites. With the launch of the first of a series of four satellites by the United States in July 1972, a capability was created to electronically gather a complete set of images of the Earth's surface. Operating in polar orbit, some 900 kilometers out in space, these 680-kilogram 3-meter tall satellites image the Earth in several spectral bands using television and electronic scanning devices. Color infrared composites or black-and-white copies of these 73-meter resolution pictures have been made available on a worldwide basis. In fact, Argentina, Australia, Brazil, Canada, India, Italy, Japan, South Africa, Sweden, and Thailand, have all established ground reception and data processing facilities for direct reception of the Landsat data.

With the worldwide availability of this type of data, libraries can now serve as access points to microfilm browse files of the Landsat data, and images of most of the landmass of the Earth are available for reference and use. The worldwide market for this type of product will soon be expanded when France and Japan launch similar Earth resource satellites in 1984 and 1985, respectively. Great interest will no doubt be shown in the French SPOT (Satellite Probatoire pour l'observation de la Terre) satellite because the ground resolution of the SPOT data is planned to be 10 meters. With increased resolution, many scientists will find SPOT products even more useful than those produced by Landsat.

Microfilm

By the early 1970's it had become clear to earth science information specialists that some newer method of storing and accessing millions of maps, aerial photographs, and space images needed to be found. The first obvious solution was the use of microfilm. The use of 35-mm and 16-mm microfilm had been

successfully demonstrated for the print medium, and now the specialist began to microfilm cartographic and geographic products. Black-and-white microfilm was used in the United States by the National Archives, the Library of Congress, the National Cartographic Information Center (NCIC), and the Earth Resources Observation Systems (EROS) Data Center, which is the major United States depository for aerial and space photographs.

NCIC's work began with the microfilming of topographic maps of the United States. Virtually all the maps published by the Geological Survey since 1884 are available on 35-mm microfilm. There are approximately 500 maps on each of the 275 30-meter rolls. The maps are filmed at a reduction ratio of 20X and each map reduction retains the publication and legend information, the producer's identification, and a roll/frame identification number.

Commercial companies and university microfilming operations have also begun microfilming maps, with several of them placing as many as eight maps on each 105-mm microfiche. The National Archives and the Library of Congress have usually placed one map on each 105-mm microfiche.

The EROS Data Center began a program in the mid-1970's to place indexes for aerial photographs and space images on 105-mm microfiche. Information like the principal map name that covers the area, dates of the photographic coverage, emulsion type, and the collecting agency are printed in eye-readable type at the top of each microfiche. In the case of aerial photographs, photomosaics of several flight lines of photographs have been filmed instead of each individual picture. By placing this information on the microfiche, photographs of a specific geographic area can be quickly located, and the user or customer can see them prior to purchasing needed reproductions.

The use of microfilm and microfiche to store vast quantities of earth science maps and photographs has been well proven. Thousands of products can be stored in a very small space, and reproduction costs are minimal. Duplicate microfiche can

be reproduced for less than \$0.10 per fiche and duplicate 35-mm rolls of silver-emulsion roll film can be reproduced for around \$20.

A problem with using microfilm, however, is that full-scale reproductions of the images on the film or fiche are seldom as clear or sharp as the original map or photograph. Another problem is that if the maps have extensive shaded areas, lines running through these areas may be hidden by a gray tint on the copy. Remember too that most microfilming today is still being done in black-and-white because of the high cost of color materials and color processing. New higher resolution color emulsions are being used for microfilming antiquarian maps and various geologic maps, on which many colors are used to depict various categories of information. This approach is very useful in map libraries where rare and valuable maps need to be protected. Users can view magnified versions of the maps to study them without having to handle the original. Using microfilm also can reduce the possibility of scratching the original aerial photographs.

Another important advantage of working with microfilm is that it does not require the same environmental conditions as the original products do. "Persons responsible for map collections need to be aware of essential measures which should be employed properly in maintaining an effective map collection. . . . Relative humidity should be controlled to ensure maximum preservation of maps. Storage at 30% relative humidity and 20°C can increase the life of the average U.S. Geological Survey map from 97.2 years to 361 years. For every 5°C drop in temperature, the life of paper doubles. . . . All light is damaging to maps and ultraviolet light is most most damaging. Maps exposed to ultraviolet light, an element of daylight and fluorescent light, become brittle and lose strength. Special glass windows such as Solar Bronze or Grey and fluorescent lights with outer ultraviolet filters are recommended for map storage and utilization areas." [3]

"As each new generation of microfilm users ascends its learning curve, there is renewed interest in the obvious need for color

microfilms. This is especially true amongst map and art librarians: color is an intrinsic part of both disciplines. . . . Color film is still inferior in resolution and longevity, and the recommendation still persists: if you want durable color microforms, black-and-white separations are the only way to obtain them. . . . But what do we do in the meantime? There are many good reasons accumulating for taking a more pragmatic approach towards the problem. For instance, one of the traditional arguments against color microforms is their great expense. Like all other options in microform circles, this is addressed toward the average user. However, map libraries are dealing with almost nothing but special cases. What if, as commonly occurs, in spite of its great expense, a color microform should prove cheaper to buy than the paper edition of the map? Added to its cheaper storage cost and its 25-50-year shelf life--as compared to paper's 100 years--would it not make sense to consider the microform? Even if it will have to be replenished every 25 years on average, would it perhaps be worthwhile? And, even if it were expensive to replicate--say \$2 per microfiche positive--would certain professional users be willing to bear the expense?" [4]

Once cartographic materials are properly stored, someone will want to find and use them. "Every repository of information faces the problem of retrieval. To retrieve a discrete item is the simplest level of service. . . . Map collections have found that the primary requests for maps are area-oriented with temporal and thematic descriptions." [5]

A microfilm system accessed by computer-assisted retrieval is an excellent way to retrieve data by these criteria. As long as the image has a discrete number encoded into the computer record, one can locate the image. The computer can readily search the file on the basis of geographic area, map name or title, author, subject, or coordinates, and direct the user to just the frame he or she needs.

The use of microfilm and the development of computer-assisted microfilm retrieval programs is spreading worldwide. Larry

Cruse, writing in the Special Library Association Geography and Map Division Bulletin of June 1980, states:

"Canada's Department of Energy, Mines, and Resources, Surveys and Mapping Branch, is now producing its map catalog on microfiche. This is an encouraging first step for those of us who hope that they will someday make the maps available on microfilm too, a boon to those who cannot justify the expense of housing such a large volume of maps any other way. This is doubly true for superseded editions. . . ."

"Great Britain's Ordnance Survey has gradually sophisticated its large-scale mapping on microfilm program to the point that the microfilm product now rivals the hard copy program in volume of sales. Since these maps are black and white line products, they make an excellent starting point for a microfilm program that supplies rapid update of maps important to local studies, exploiting, too, a capacity for scale change to suit users needs. The Ordnance Survey is also considering the possibility of expanding the micro-filming program to other map series, as a means of giving their maps wider distribution." [6]

In 1974, the Comptroller General of the United States, the Congressional Joint Committee on Printing, and the Government Printing Office in 1975, 1977, and 1978, all recommended that Government agencies convert as many publications as possible to microfiche because of the cost savings. A 1979 survey of publications sales by the U.S. Geological Survey indicate that approximately 25 to 30 percent of all copies of its open-file reports are sold on microfiche, and that approximately 96 percent of the microfiche sales are to Government, schools, libraries, and industry, where microfiche readers and reader/printers are commonly available. Interviews with librarians and editors of scientific journals substantiate these figures and confirm that microfiche publications broaden distribution. Microfiche is cheaper to handle, store, and mail; does not get marked up; and lasts longer, and thus, encourages libraries to expand their collections and subscriptions to include material

they formerly did not have money or space to include. Many earth science publishers and geological surveys are microfiching all of their publications to date so that users can have a complete set of all of that organization's publications on microfiche. [7]

Digital Cartography

Another important technical advance that is underway at this time is the process of producing and distributing digital cartographic and geographic materials on magnetic tape. Even though the shelf life of this storage medium is said to be only about 10 years, more and more of this type of data are available to scientists and specialists for use. The U.S. Geological Survey has been designated as the principal Federal civilian agency for the coordination and production of this type of earth science information. In 1982, the National Mapping Program began distributing this data under the descriptive name US GeoData. The following is a description of these data taken from the various sales brochures:

US Geodata tapes are computer tapes which contain cartographic data in digital form. US GeoData digital terrain tapes and digital elevation models (DEM's) are digital records of terrain elevations for ground positions at regularly spaced intervals.

US GeoData tapes for terrain elevations are available in three different formats. One format is U.S. Geological 1:24,000-scale digital elevation model data. These data are available in 7.5- x 7.5-minute blocks which correspond to U.S. Geological Survey topographic quadrangle maps. Each DEM covers approximately 155 sq. kilometers. The ground distance between each digitized point is 30 meters.

The second format available is the 1:250,000-scale digital elevation model data. These data are available in 1°- by 1°-blocks. The ground distance between each digitized point is 3 arc-seconds.

The third format is 1:250,000-scale digital terrain or

planar data, also available in 1°- by 1°-blocks. The ground distance between each digitized point is approximately 60 meters.

U.S. Geological Survey 1:250,000- and 1:24,000-scale DEM's are produced either from contour plates that have been digitized or from stereomodels. The accuracy of these elevation models is dependent upon the scale of the source materials from which the data were obtained.

Digital cartographic data are useful for producing regional terrain models, for land use studies and for producing slope maps. They can be used in connection with stream location data and weather data to plan forest fire control and in conjunction with terrain and gravity data for use in the search for energy resources, determining the volume of water in proposed reservoirs, calculating the amount of material removed during strip mining, and determining landslide probability. [8]

Another popular digital cartographic product is the digital line graph (DLG). These DLG's consist of computerized records of the X and Y coordinates of the lines on a map collected at some preselected spacing along the line. These strings of points are usually digitized by categories so that it is possible to deal with just the boundaries, or the transportation, or the hydrography. Since this form of US GeoData is prepared using geographic coordinates, it is possible, using appropriate computer software, to plot the data at various scales and on selected projections. You can construct maps of your own choosing. For example, you can produce a map showing only national forests and rivers or construct a simple base map containing only boundaries. Certain calculations can also be performed using DLG data such as calculating the distance between two points, determining the length of a coastline or the total length of the rivers and streams in a given area. [9]

Two other computerized earth science products now being

produced and sold in the United States are land use/land cover data and geographic names data.

The land use data consist of polygons of land use or land cover information that have been classified and digitized at 1:250,000 or 1:100,000 scale. The land use has been classified according to nine major categories (urban, agricultural land, rangeland, forest land, water, wetland, barron land, tundra, and perennial snow or ice) and 37 subcategories. Categories can be totalled by geographic area, watershed, or map sheet. Area coverage can also be calculated in hectares.

The newest US GeoData file now growing in popularity in the United States is the geographic names file produced by the Geological Survey. This file consists of the geographic coordinates for all of the feature and place names on the topographic maps of the United States. This type of data can be used in automated type placement systems and by geneologists looking for family names that have been used on lakes, ponds, mountain peaks, towns, or other geographic features.

Image Processing

Numerous advances in the earth sciences are being made these days because of computerized image processing. This can best be illustrated on a worldwide basis by the Landsat satellites. These satellites are the source of data that can be produced in photographic form, as well as in digital form and can be stored on computer compatible tapes and processed for detailed analysis by earth scientists. The data can be processed for each spectral band or as combinations of bands. Scenes from different seasons can be combined and colors assigned to different densities of data or land cover categories. Contrast levels can be "stretched" from the 15 shades of gray that the average eye can see to the 64 that the television monitor can handle. Once colors are assigned to these shades of gray the human eye can then see an enhanced image of the area. These techniques are being used for minerals exploration, vegetation analysis, habitat studies, water quality assessment, oil-spill monitoring, crop identification, weather analysis, and many others.

Video Disks

The latest high-technology advances that may provide libraries with rapid access to vast quantities of earth science information and data are those involving video, magnetic and optical disks.

Most mapping agencies throughout the world have begun to convert their cartographic and geographic data into digital form. Using digitizers, computers, and plotting devices, map information including boundaries, geographic names, hydrography, hypsography, and transportation can be stored, recalled, and plotted when necessary. Newer data can be electronically compared with the older data for faster updating and revision. Data can be collected at one scale and plotted at another. Maps are being electronically scanned by devices derived from machines originally used in the textile industry to scan patterns for printing cloth or wallpaper. With certain modifications these devices are now used to scan topographic maps and simultaneously separate all the features by color and store an electronic record of each. [10]

The generation of vast amounts of this type of cartographic and geographic information will require the development of extremely large data bases. Video disks and optical disks both appear to have tremendous potential for storing and displaying these data--the video disks for graphics and the optical disks for numerical data.

Several companies in the United States are now photographing maps, charts, and aerial and space images on film and then transferring them to video disks. Then through the use of an accompanying microcomputer, the viewer can rapidly browse through this collection of maps, view whichever ones he or she wants to, and even examine the area in different degrees of detail by switching to different viewing scales. If each product has been photographed in 3- or 4-centimeter-square blocks the viewer can electronically scan the map in such a way that on the screen it appears that you are flying over the map itself. When you reach an area of interest you can stop, change scales, or even electronically write on the display

using a standard light pen. In this fashion one could plan routes for roads, pipelines, or canals, or simply decide on a hiking trail. Remember, too, that this type of information can be transmitted to other points as a standard television signal.

As one leading company in the field said in its news release on this type of system: "Each videodisc, which has the appearance of a phonograph record, has the capability of containing about 54,000 separate frames of information per side. Depending upon the extent of information required the user is able to control the route of travel, viewpoint, degree of magnification, rate of speed, and access to related data, and have it all before him on the television screen with the touch of a finger." [11]

How can all of this be of use to a library? First of all you should consider space. If you have, or are interested in handling topographic, hydrologic, geologic, transportation, and hundreds of other types of maps, you know how much floor space and how many map cabinets you may have to have. It has been estimated that to house the current collection of U.S. Geological Survey maps, approximately 225 square meters of space is required. On the other hand, this same collection could be stored on video disks in about 1 square meter of space. This ratio of 225 to 1 is significant when calculating the cost of building space, the staff required to service the collection, and the potential for loss of materials.

The negative aspects of this type of information storage system are the same as in the microform world--the lack of good hard copy or the ability to reproduce inexpensive copies of what appears on the screen. While there are both black-and-white and color hard-copy video printers available, they cannot print 1:1-scale reproductions of any maps larger than 22 x 28 centimeters. This may be satisfactory to many, but others may still wish to access the original product. In this case the video disk system can still be of tremendous use to the library as a browse file that can save endless hours of searching for just the right map by not having to go from drawer to drawer to find what you want. Using the display device will also protect rare documents while still allowing people to study the information

displayed on them. Disks containing images of rare manuscripts and collections can be sold or loaned by libraries and used to supplement existing collections.

Another major problem with this approach to handling earth science materials is the cost and time required to create the original data base. As with any new technology someone has to design the system, collect and organize the materials, and then do the filming necessary to create the video disks. The process for producing the master video disk is patented and only done by a few firms. Once the master or "mother" disk is created, however, any number of high-quality duplicates can be made. The cost of producing video masters is high. In fact, it is estimated that between \$2 million and \$3 million would be required to place on disks, the approximately 55,000 current earth science maps produced by the U.S. Geological Survey. This estimate includes filming each 3- to 4-centimeter-square block of each map. A project is now under way to determine the largest map area that should be used for maximum detail on the TV viewing screen. If it is more than 3 to 4 centimeters square, then the cost of creating the file will be reduced. Determining this factor will also determine how many 30-centimeter disks will be necessary to house the entire collection. It is estimated that the disks will most likely sell commercially for between \$25 and \$40. The cost of the microcomputer, access control unit, keyboard, video disk player, video and computer monitors, and the hard-copy unit is estimated to be around \$30,000. It should be noted that the disks will also be usable on any standard \$400-\$600 video disk player connected to a standard color television set. The ability to move over the maps would not be possible with this basic system, but frame-by-frame access would still allow one to see each segment of the map.

In addition to maps, aerial photographs and space images are also excellent candidates for video-disk information systems. The National Aeronautics and Space Administration (NASA) recently placed on video disc many of the 200,000 electronic images collected by the Viking, Explorer, and Surveyor spacecrafts of Mars, Jupiter, and Saturn. NASA's Jet Propulsion

Laboratory estimates that a complete microcomputer/video-disk system to handle their disk should cost around \$8,000.

Larry Cruse, of the University of Southern California at San Diego, writing about this project for the November 1982 Information Bulletin of the Western Association of Map Libraries, stated that:

"Their first production disc which carries about 100,000 planetary images will be sold for \$50. That is about 2,000 images per dollar. For the sake of comparison, diazo microfiche can be produced for 5 cents each, and each can carry approximately 100 to 200 frames; at the rate of 20 fiche per dollar, the yield is from slightly under 2,000 to slightly over 4,000 images per dollar. The quality of images is not as good on the microfiche, however, as on the disk we saw, nor is paging through microform graphic indexes anywhere near as easy or quick. The sample disc also included some color images of Jupiter which were especially illustrative of the potential of this medium. The cost of producing the master disc ran about \$10,000--or about 5 cents per image--a figure comparable to 35-mm roll microfilm commercially available." [12]

While maps are one of the most important tools to the earth scientist, libraries will also no doubt be acquiring many other video-disk products which could be used on the systems like those just described. Self-prompting courses on disks will no doubt be commonplace in the years ahead. In fact with the video camera, field trips could be taken without leaving the classroom. Trips to the moon and outer planets can be simulated on disks and all sorts of land use, agriculture, census, and statistical data can be used with the video/microcomputers. All of this will place large demands on scientific agencies to generate the larger data bases from which the information for the disks will be drawn. This is an area where the optical-disk technology appears most promising.

Optical Disks

In addressing the future trends in mapping Rupert B. Southard, Chief of the National Mapping Program of the United States, said, "The need to archive large and rapidly increasing amounts of digital cartographic data for both resource inventory, analysis and data bank purposes will lead to continuing advancements and developments in optical disks, holographic, and other forms of machine-readable, non-magnetic, high-density mass storage devices and associated storage and retrievable processing technology." [13] In addition to optical disk technology, mass storage problems may be solved by systems using random access memory, bubble memory, charge-coupled devices, and video tape systems. But the laser optical disk appears to be the technology most likely to succeed for storing data on the order of 10^{13} to 10^{14} bits. [14]

Larry Cruse states, "The leading candidate (to serve as the bulk storage medium in map libraries) right now, of course, is the optical disc. Such discs are almost too good to be true. Asking only that we sacrifice the immediate capabilities of paper and microfilm, they offer storage capacity of 54,000 map images on the equivalent of a long-playing record. They are archival, computer compatible, and cheap to produce; hardware will be relatively cheap, even if it is only for visual playback. Their only real drawbacks are that they are absolutely mechanical, and require a certain amount of organization to get them encoded." [15]

Optical recording is a new technology using lasers to record and playback information. The basic operational concept of the technology involves:

1. Focusing a laser beam to a 1-micron spot size.
2. Selectively burning holes in the surface of the disk to record the digital information.
3. Playing back the recorded pattern using a laser at a reduced power. [16]

Using this approach each optical disk should be able to hold 4×10^9 bits of data. There are still some unknowns concerning this type of technology, such as how long is the shelf

life of the disks, and how can they be updated or changed. Presently, when the information is placed on the disk, it is permanent. Some suggest, however, that erasable disks will be produced in the near future.

To hold the data base of 50,000+ current maps produced by the U.S. Geological Survey, 4,000 thin plastic disks would be required. These disks could be stored in three or four ordinary filing cabinets. [17]

Having all of this data available in a disk library will not be the answer to each librarian's dream. The bulk of the developmental effort will have to be in the area of software necessary to extract, use, and return the proper information for each request or search. It does appear, however, that much of the world's future earth science data will be placed on optical disks.

Conclusions

How does all of this affect tomorrow's libraries? Much is being written about the revolution in information technology and digital cartography. Video disks, microcomputers, image processing, and computer graphics are all a part of this revolution. Things are progressing so fast in the information field that it is said that if the same advances were being made in the aircraft industry that a new jet plane would cost \$500 and would circle the globe in 20 minutes on 19 liters of fuel.

In the past, the library has always been the principal source of information. Earth science materials have always been deposited in the libraries in the form of maps, charts, books, and scientific and technical publications. But today's libraries may be facing the biggest challenge in their history. Most libraries are desperate for space just at a time when more and more information is being produced. They are also facing a financial crisis at a time when significant funds are needed to acquire the more advanced equipment necessary to handle the newer earth science materials. Take digital cartography for example--with several computer tapes one could produce a variety of one-of-a-kind maps at whatever scale or projection you desire.

With a computer and plotting device the library would be able to print out this map, on demand, for a customer. The map would probably never be cataloged or copied because the important items are the computer tapes which have the raw data on them and not the resulting map. Becoming comfortable with this concept will be difficult, especially for map librarians. Computer tapes, however, are magnetic and at this point, are unstable and not of archivable quality. Only paper and film are now suitable for the long term storage of graphic products. Thus, users and librarians will have to wait for the video disk systems. It is estimated that the development of this technology could result in a \$40 billion-a-year industry within 5 years.

The discussion of video and optical disks in this paper points out another long-range possibility for libraries--no books. With the storage capacity of these systems, tomorrow's libraries may consist of rooms of video monitors and computer terminals instead of shelves full of books. In fact, many users may well be sitting at home or in their offices as they call up the information they need, scan it on a television screen, and print out what they want to retain.

Even the world of image processing will move in this direction. At present, efforts are underway in the U.S. Geological Survey to develop a small portable continuous-tone image-analysis device coupled with a microcomputer that will allow one to access larger computers and do complex image processing. In addition, this system will allow the earth scientist to display cartographic data such as geologic and geophysical data and stream and sediment analysis data. Referred to as a Remote Information Processing System (RIPS), this device uses as input, data on small magnetic disks--the same ones used in basic home computers or word-processing systems. In the future, people may be able to buy scientific data bases at local book stores on these so-called "floppy disks."

And what about microfilm? Many experts feel that even though you can store vast quantities of texts and documents cheaply on microfilm, the microcomputer and video disk technology will be

the way to handle information and earth science products in the future. People still are not comfortable with microfilm or microfiche and very few products are available in color. But everyone has come to accept the television set and through video games, people are now becoming more comfortable with the home computer.

This, then, is the future for tomorrow's libraries--more and more earth science data being made easily available on video disks and optical discs for use with microcomputers. If you do not believe this will happen, look at the school children today who are using computers and videographics. The generations behind will expect earth science data in this form.

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Division: SPECIAL LIBRARIES

Section: GEOGRAPHY AND MAP LIBRARIES

29 - GEO - 2 - F

Influence des nouveaux types de documents cartographiques
sur la politique d'acquisition d'une cartothèque nationale
par Edwige ARCHIER, Conservateur au Département des
Cartes et plans,
Bibliothèque nationale, Paris, FRANCE.

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LA POLITIQUE D'ACQUISITION D'UNE CARTOTHEQUE NATIONALE

Service public ouvert à un éventail très large d'utilisateurs : géographes, historiens, architectes, aménageurs ..., une cartothèque nationale a une mission extrêmement claire. Elle est responsable de la collecte, de la conservation et de la transmission de toute la production cartographique du pays, quel que soit le type du document. Selon les pays, cette collecte est principalement alimentée par le copy-right, ou comme en France, par le dépôt légal qui soumet au dépôt, à la Bibliothèque nationale de Paris : "les imprimés de toute nature, les oeuvres musicales, photographiques, cinématographiques, phonographiques, mises publiquement en vente, en distribution ou en location ou cédées pour la reproduction". Achats, dons et échanges comblent les lacunes éventuelles du dépôt légal, et enrichissent aussi les collections par l'entrée de documents anciens ou étrangers.

Pour la production cartographique étrangère, la politique d'acquisition d'une cartothèque nationale est plus difficile à définir et à mener à bien. Elle doit s'efforcer d'acquérir une sélection d'atlas, de cartes générales et de cartes topographiques à moyenne échelle.

La collecte exhaustive de la production cartographique du pays reste donc l'objectif principal d'une cartothèque nationale. Cette tâche est cependant utopique, à cause même de la diversité et du volume du matériel cartographique en circulation. En effet, la variété des supports : parchemin, papier, film, bande magnétique, écran cathodique ; les nombreuses étapes d'élaboration : calques, minutes, cartes définitives ; la multiplicité des produits finis : plans, cartes, photographies aériennes et images de satellite, conduisent à une sélection et au partage, entre plusieurs centres documentaires.

L'examen de la situation française peut nous éclairer sur les avantages, mais aussi sur les dangers de cette sélection, si celle-ci n'est pas l'effet d'une politique réfléchie et bien établie institutionnellement.

Fondé en 1828, le Département des Cartes et plans de la Bibliothèque nationale réunit les meilleures conditions qui sont propres à

lui donner le titre de cartothèque nationale. Grâce au Dépôt légal, on peut en principe y consulter toute la production cartographique française imprimée, tant ancienne que moderne. A la faveur de dépôts, on peut y trouver aussi des documents d'archives, comme ceux provenant du Service hydrographique de la marine.

LES DOCUMENTS D'ARCHIVES

Par la nature de leurs fonds, les Archives nationales et départementales françaises, détiennent la plupart des plans cadastraux, plans de terroirs et de forêts, plans d'urbanisme, d'architecture ou d'équipement, conservés dans les dépôts publics. Le plus souvent, ce sont des documents anciens, manuscrits, à très grande échelle, dont l'étude et la mise en valeur sont inséparables de dossiers d'archives. Aux Archives nationales, la série N, qui est la plus consultée, comprend environ 16000 pièces.

La création en 1954 du Service des Cartes et plans des Archives nationales, et la publication d'inventaires ont confirmé cette spécialisation, devant laquelle le Département des Cartes et plans de la Bibliothèque nationale s'efface bien volontiers, pour en tenir compte dans sa politique d'acquisition.

LES PLANS CADASTRAUX

La production cartographique du Cadastre, qui dépend du Ministère de l'économie et des finances, est une oeuvre imprimée scientifique à grande échelle, tout naturellement soumise à la formalité du dépôt légal. Cependant, à l'exception des feuilles se rapportant à la Région parisienne, aucune feuille du Cadastre n'est déposée à la Bibliothèque nationale. La charge énorme que représenterait le stockage d'une série de documents très spécialisés, qui doublerait par son volume les collections du Département des Cartes et plans, explique certainement cette dérogation à la règle. Cette position nous semble raisonnable, dans la mesure où le Service de la documentation nationale du Cadastre, qui conserve aujourd'hui plus d'un million de plans cadastraux et de plans topographiques des agglomérations urbaines, est largement ouvert au public.

Ainsi, pour les plans cadastraux imprimés, la mission nationale du Département des Cartes et plans est volontairement réduite à une dimension régionale.

LES PHOTOGRAPHIES AERIENNES

Aucune photographie aérienne n'est conservée au Département des Cartes et plans. Pour expliquer cette absence, on ne peut plus invoquer le manque de place, mais plutôt le défaut de formation des cartothécaires auxquels l'intérêt scientifique de ce nouveau type de document cartographique a échappé. En effet, une carte topographique et une photographie aérienne de la même région sont parfaitement complémentaires et s'enrichissent mutuellement. La carte topographique apporte une échelle stable, la toponymie, les limites administratives et l'expression du relief ; la photographie aérienne offre une richesse de détails et une fréquence dans la mise à jour inégalées.

Certes, le très petit nombre d'utilisateurs qui s'adressent au Département des Cartes et plans pour y consulter des cartes topographiques modernes, et éventuellement des photographies aériennes, ne rentabiliserait pas l'espace et le personnel nécessaires aujourd'hui à leur gestion. Cependant, une couverture régionale limitée, comme pour les plans cadastraux, à la Région parisienne, devancerait à coup sûr, les demandes des futurs utilisateurs. Heureusement, pour les historiens et les géographes à venir, cette défaillance est corrigée par la constitution, depuis 1946, du Centre de documentation de photographie aérienne. Sa gestion est confiée à l'Institut géographique national, principal producteur et utilisateur français de photographies aériennes verticales. Actuellement, plus de 3,5 millions de clichés aériens, couvrant la France et ses anciennes colonies, à des échelles comprises entre 1 : 1 000 et 1 : 1 000 000, y sont parfaitement conservés, répertoriés et classés. Ils sont accessibles à tout demandeur, qui peut les consulter sur place ou en acheter des tirages.

LES IMAGES DE SATELLITE

Avec les images de satellite, prolongement naturel des photographies aériennes, nous abordons le domaine des technologies nouvelles avec lesquelles bien peu de cartothécaires sont familiarisés. Pour interpréter les données enregistrées à bord des satellites d'observation de la terre, les

ingénieurs ont mis au point des systèmes de traitement numérique des images, qui débouchent sur des produits divers et fragiles : films à visualisation rapide sur écrans, bandes magnétiques utilisables par des ordinateurs et films photographiques.

Depuis 1972, date de lancement du premier satellite américain LANDSAT, de très nombreuses images spatiales, en noir et blanc ou en couleurs, sur film ou sur tirage papier, à des échelles allant de 1 : 250 000 à 1 : 1 000 000, sont disponibles sur le marché. C'est le G.D.T.A. (Groupement pour le Développement de la Télédétection Aérospatiale) à Toulouse qui, en France, est le distributeur officiel de l'imagerie LANDSAT. A ce titre, il conserve une importante collection sur la France, comprenant 20 scènes RBV (Return Beam Vidicon) et 500 scènes MSS (Multispectral Scanner System), sur quatre canaux.

L'utilité des données de satellite pour la cartographie, et le besoin d'un meilleur outil que LANDSAT, ont incité la France à construire son propre satellite d'observation SPOT, dont le lancement est prévu début 1985. L'Institut géographique national, qui collabore à ce programme, souhaite assurer l'archivage et la conservation, sur disques numériques, des bandes magnétiques sur lesquelles sont enregistrées les images SPOT, et qui dans le projet, ne devraient être gardées que quelques années.

Mises à part les rares images imprimées et commercialisées, on ne s'étonnera pas d'apprendre qu' aucune image spatiale, n'est conservée au Département des Cartes et plans, qui reconnaît l'autorité de l'Institut géographique national et des laboratoires de recherche dans ce domaine.

VERS UNE POLITIQUE NATIONALE D'ACQUISITION

Les exemples précédents montrent comment la diversification, le volume, l'innovation et le coût des documents cartographiques ont entraîné un partage des tâches plus ou moins tacite. Les institutions cartographiques, prenant peut-être conscience du rôle à jouer dans la conservation du patrimoine, se sont donné pour mission d'assurer la garde d'un échantillonnage complet de leur propre production. Cet état de fait a certainement induit, puis conforté la politique d'acquisition sélective du Département des Cartes et plans, qui s'efforce d'éviter le double emploi. Mais

le danger est grand de voir cette cartothèque nationale se transformer définitivement en musée. Aussi, depuis quelques années, sous l'impulsion du Département des Cartes et plans, une tentative d'organisation a été engagée, qui se manifeste sous plusieurs formes :

- la publication de répertoires et de catalogues collectifs permet de mieux connaître les ressources et la spécialisation de chaque cartothèque, et de sélectionner les acquisitions sur le plan national.

- la création en 1981, d'une commission Documentation, au sein du Comité français de cartographie, regroupant cartographes et cartothécaires, laisse espérer qu'une meilleure diffusion de l'information soutiendra l'effort de coopération des différents services.

Enfin, dans un avenir proche, il est souhaitable que l'outil informatique vienne concrétiser cet effort par l'élaboration d'un fichier commun.

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IFLA GENERAL CONFERENCE MUNICH 1983

Division: Special Libraries Division

Section: Geography and Map Libraries Section

138-GEO-4-E

British Map Collections : Cooperative Planning and Projects

by

Helen WALLIS

Map Librarian

British Library

London, U.K.

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BRITISH MAP COLLECTIONS : COOPERATIVE PLANNING AND PROJECTS

By Helen Wallis

Great Britain preserves some of the earliest established map collections in Europe as the first edition of the IFLA World Directory of Map Collections (1976) bears evidence. It may seem paradoxical therefore that the major institution of the national library system, the British Library, is only ten years old. It was established on 1st July 1973 from a number of independent institutions and organisations, comprising the library departments of the British Museum, the Science Reference Library, the National Central Library, the National Lending Library for Science and Technology, British National Bibliography Ltd, and the Office for Science and Technical Information (OSTI). From these were formed the British Library Reference Division, the British Library Lending Division, the British Library the Bibliographic Services Division, and the Research and Development Department. In 1982 the Library assumed responsibility for the India Office Library and Records (IOLR).

These constitutional changes form the background to recent developments of cooperative planning in the field of map librarianship. The Map Room of the British Museum became the Map Library of the British Library Reference Division. The map collections of the Department of Manuscripts, the Department of Oriental Manuscripts and Printed Books, and the Science Reference Library were likewise transferred. With the transfer of IOLR in 1982 the Library now has responsibility for the fine map collections of the India Office Records which are analogous in character to the Foreign Office, Colonial Office and War Office map collections, now in the Public Record Office.

Some of the responsibilities which the British Library assumed in and since 1973 have had only limited implications for maps. The Lending Division at Boston Spa in Yorkshire, for example, does not lend and therefore does not hold sheet maps, although atlases and books about maps are in the system. The Bibliographic

Services Division had to concentrate at first on the automation of the cataloguing system for books. The automated information service - BLAISE - provides access to over 2.25 million bibliographic records of books published in the United Kingdom and abroad, and these include ^{some} atlases, books on cartography and maps published in book form. They do not include sheet maps published in series by the Ordnance Survey, the Hydrographic Department, the Directorate of Military Survey and other cartographic agencies. There is as yet no British National Bibliography for maps. Nevertheless some progress in this direction has been achieved. We can say that the founding of the British Library has enabled the Map Library to function more fully as the national map library of UK and has considerably increased the scope for cooperative planning.

The British Committee for Map Information and Catalogue Systems

The starting point for cooperative activities through the library network dates from 1977 with the formation of a British Committee for Map Cataloguing Systems under the auspices of the Map Library. The Committee includes the map librarians of the other copyright libraries (the National Library of Scotland, the National Library of Wales, the Bodleian Library of the University of Oxford, and Cambridge University Library) and of government departments such as the Mapping and Charting Establishment (RE), of the Directorate of Military Survey. To meet the Committee's expanding range of responsibilities membership has recently been (amongst others) extended to include/officers of the Library Association, the Society of Archivists, and the Map Curators' Group of the British Cartographic Society; and the Committee has been renamed the British Committee for Map Information and Catalogue Systems (BCMICS). To date an ad hoc body, the Committee is now preparing the text of a formal constitution.

The Committee's first task was to develop programmes for the cartographic interpretation of the Anglo-American Cataloguing Rules Edition 2 (AACR2) and for MARC Maps. An AACR2 Working Party was set up in 1979 following a meeting

of Anglo-American map librarians in Ottawa under the auspices of the Public Archives of Canada. Its purpose was to consider the proposed manual of interpretation for the Anglo-American Cataloguing Rules Edition 2, which was designed to give guidance on the cataloguing rules for cartographic materials. Comments and proposals for rewordings were sent to the main Anglo-American Committee for cataloguing cartographic materials, and two members of the Committee attended a meeting held in Washington DC in 1980. The Secretariat in Ottawa, under the general editorship of Hugo Stibbe, completed the work on the volume, entitled Cartographic Materials : A Manual of interpretation for AACR2 (1982). It was published in North America in August 1982 and by the Library Association of Great Britain in March 1983.

In 1981 a Memorandum of Agreement was drawn up to formalize the then ad hoc Anglo-American Committee for Cataloguing Cartographic materials. The Library Association of Great Britain, the British Cartographic Society and the British Library were signatories to the agreement as association and institutional members representing Great Britain. Participation in the work of the Anglo-American Committee will continue to be directed through the British Committee.

UK MARC Maps

A second Working Party was set up by the Committee in September 1980 to create a UK MARC format for maps. Its immediate programme was as follows:-

1. to confirm that all necessary descriptive rules defined by AACR2 were included in the existing UK MARC format;
2. to study other MARC maps formats to see whether any existing fields were required in the UK MARC format;
3. to propose elements new to the MARC format in general and required to meet the special needs of cartographic materials.

Proposals were then put to the British Library Bibliographic Services Division defining the elements which should be included in the national UK MARC format for maps. These would enable a UK MARC record for cartographic items to be retrieved both in an automated catalogue and in an information retrieval system.

The fields and enhancements proposed are expected to appear in Change 3 of the UK MARC Manual Edition 2, due for publication in 1983.

The fields added are as follows:-

<u>TAG</u>	<u>DESCRIPTION</u>
026	ISCN (reserved for future use)
<u>TAG</u>	<u>Coded data fields</u>
031	Relief, projection and prime meridian
032	Geodetic grid and vertical measurement
034	Scale and coordinate
036	Dates
037	Physical description codes
038	Aerial photography and remote sensing imagery
062	(MOD) Manual of Map Library Classification and Cataloguing GSGS 5307, 1978.
	<u>Other fields</u>
557	Graphic index and characteristic sheet note
653	British Library Map Library Subject Heading
	(local fields)
749	Personal provenance
759	Corporate provenance
	§a dates
	§b given on the map
	§c linking document reference
961	Holdings

A paper setting out the structure of the enhancement fields and coded data fields is available on request.

The next stage is the implementation of the proposals. The publication of these enhancements not only opens the way for the creation of a UK MARC record for maps but has other implications, as follows. First, they contribute further relevant cartographic fields to UNIMARC in the event of its future revision. Secondly, they provide a framework for work by the UK Cooperative Automation Group (CAG) on Bibliographical Standards. An ad hoc panel for maps met on 22nd June 1983 to report back to CAG on a 'Proposed Recommended Input Standard for Cartographic Materials'. The requirement for an indication of geographical area was strengthened by making it mandatory to provide either 043 or 062 or 653 rather than making all three fields 'Highly desirable'. This allows contributors

a choice of methods.

It is hoped that through this work of creating a MARC format for cartographic materials, the UK library community as a whole will benefit, directly or indirectly. Even if only a few libraries are able to adopt MARC for Maps, other libraries remaining on a manual system will be able to take advantage of the results in the form of print-outs and so on. The establishment of a British National Bibliography for maps is a longer term objective to which the automation of map catalogues and the mounting of catalogue accession records on BLAISE are steps in the right direction. With the enhancements to UK MARC now complete, work on the implementation of the system in the British Library is due to begin in October 1983. This will deal at first only with Map Library accessions, but a union/^{catalogue}project for embracing all the cartographic materials in the British Library is being planned. News of developments will be reported in CABLIS Current awareness bulletin for librarians and information scientists, a monthly periodical compiled in the British Library Reference Division by the Library Association Library (ISSN 0261-2992).

The Map Research and Library Group of the MCE(RE), Ministry of Defence, as a participant in the BCMICS has played a major role with the British Library in the development of MARC Maps. Their own library automation project is now being developed with a potential which should allow exchange of records with the British Library and other interested libraries.

The MAPLIB System

Two automated systems which are fully operational have developed independently of the national library system. MAPLIB was developed by the School of Geography and Planning of Middlesex Polytechnic and is designed as an information retrieval system for current mapping in map libraries holding between 200,000 and 300,000 maps. At the time of writing MAPLIB is the only operational system in the UK

having the facility to retrieve maps by the use of geographical co-ordinates and the National Grid. (DUMARC has the facility in the Netherlands, and UKMARC will shortly have the facility, but neither is at present operational in this respect.) It should be emphasised that MAPLIB was designed not as a cataloguing system but as an information retrieval system. The geographical/cartographical attributes of a map, e.g. scale and area, are expressed by geographical co-ordinates, the cartographer and significant dates are recorded, whereas bibliographical elements are kept to a minimum. The searcher is able to interrogate the data base on the attributes either singly or in combination. For example, to find the coverage of maps for the island of Bornholm off Denmark the search query is expressed in geographical co-ordinates as follows:- LATL (i.e. latitudes/longitudes) IN 55.14.5 55.5.5. END. This is known as the 'search window' and will identify all the maps which include those co-ordinates in the data file. The search could be combined with an enquiry as to how many of the maps of Bornholm are in the Danish language.

The recording of the maps is by fixed fields for each attribute and much of the information is, of necessity, in code (see attached schedule). This facilitates searches but makes it difficult, if not impossible, to understand the record without concordances of one sort or another. The system is being continually revised and at present the version 'Release 3' of the system is available for demonstration or on dial-up access.

Ifan D.H. Shepherd, Senior Lecturer in Geography and Planning at Middlesex Polytechnic, reports that MAPLIB is now in use in three academic institutions in the UK, Middlesex Polytechnic, Brighton Polytechnic, and Coventry Polytechnic. He and his colleagues receive feed-backs from these users on the performance of the system. They also have arrangements with 'dial-up' users elsewhere. All information received is fed back into the system for improving and upgrading the programme.

Cooperative projects for the creation of machine-readable records (Mr Shepherd reports) lie in the short-term future. A complete set of records for the OS 1:50,000 series is provided when MAPLIB is distributed. It is expected that record-sharing will begin in earnest as soon as users have created a 'critical mass' of their own records in-house. At present a capability is being developed for MAPLIB to handle MARC-format map records. When this is implemented, further possibilities of cooperation will become available.

GEOSYSTEMS and MAPSYS

GEOSYSTEMS is essentially a documentation system for the mining and mineral industries and similar enterprises. It developed from a consultancy established in Canada by its Director, Graham Lea, and has been active since 1966 in the UK, Europe, USA, Canada, Australia, Morocco and Mozambique. In 1969 it set up its headquarters in Westminster, and through its work in general documentation it entered the map field. Its major client in UK was (and is) the Institute of Geological Science in London, and after dealing with the Institute's serial holdings GEOSYSTEMS devised a data base for their maps. Mr Lea reports that to date (August 1983) this contains 125,000 maps and that 70,000 non-duplicates will be available for retrieval in Mapsys, a database operated by GEOSYSTEMS and available through some 30 public data networks linked to British Telecom's International Packet Switching Service (IPSS).

GEOSYSTEMS are proposing to make their map system MAPSYS a collaborative database by encouraging map libraries and others to concatenate their databases. They have concluded that it is too expensive to record all data elements identified in AACR2/ISBD(CM). Further developments are awaited with interest.

Progress in standardisation

The British Committee for Map Information and Catalogue Systems has provided material for the revision of ISBD(CM), and this is passed on to the UBC Office

of IFLA by the UK representative on the ISBD(CM) review committee, Mrs Sarah Tyacke, Deputy Librarian of the Map Library.

Work on standards under the auspices of the British Standards Institution (BSI) has now been resumed. BS 5195 Bibliographical references to maps and charts was published in two parts, Part 1: 1975 References in accessions lists; Part 2: 1977 References in books and articles. Following recent discussions on the number of BSI Standards relating to different types of library materials the BSI agreed to review this standard with a view to combining its stipulations with those of Bibliographical References (BSI 1629). These revisions would also take account of BS 6371 - References to unpublished materials, published in 1983. A review panel (DOS/1/-/1) was set up in March 1983 and is served by representatives of the National Copyright Libraries, the Royal Geographical Society, the British Committee for Map Information and Catalogue Systems, and the British Cartographic Society Map Curators' Group. Graham Webster (MOD) undertook to rewrite the 'title' area of the standard and Sarah Tyacke (BL) undertook to rewrite the 'author' area, now provisionally renamed the 'statement of responsibility' area. These, together with other submissions, will be further considered at a meeting in October 1983 when the proposed revisions to BS 1629 will be available for review. It is envisaged that a general statement for bibliographical references will be the eventual outcome.

Organisations for map librarians

These cooperative activities on a national front have been undertaken with the collaboration of the Library Association and the British Cartographic Society, as appropriate. Maps do not feature prominently in the collections of public libraries, and this explains why no special map librarians group has been formed under the auspices of the Library Association comparable to the Round Table in the USA. Likewise the lack of a Special Libraries Association has meant that there is nothing comparable to the Geography and Map Group of the Special Libraries

Association in USA. In UK the British Cartographic Society, founded in 1963, was chosen as the umbrella organisation for map curators. Its 'Map Curators' Group' was formed in 1966. Over the years the Group's activities have included organised visits to map collections, courses in work with maps (in collaboration with other organisations such as ASLIB, the British Library, the National Library of Scotland, Edinburgh University Library, and so on). Recently the convener of the Map Curators' Group launched a newsletter called 'Cartographiti'. The map curators in universities are catered for by the Society of University Cartographers (SUC), founded in 1964.

Liaison with cartographic agencies

Through the British Cartographic Society and the Society of University Cartographers a fruitful liaison has been fostered between map users in the map library community and the map producing agencies. The copyright map libraries and other institutions such as the Royal Geographical Society also maintain direct contact. This liaison is all the more important in view of the rapid progress now being made in the application of computers and other advanced techniques to map compilation and production. Remote sensing has greatly extended the scope of cartographic production, for example, and the creation of a national digital database is expected within the next ten years. How map libraries will deal with the new styles of data storage which these changes entail is an urgent question. The British Government recognised the importance of these developments when it set up in the House of Lords, under the Select Committee on Science and Technology, a Subcommittee on remote sensing and digital mapping. The Department of the Environment (on 2 March 1983), the Department of Industry (on 16 March 1983), the Royal Geographical Society (on 30 March 1983), the National Environmental Research Council (on 20 April 1983) and the Royal Society (on 27 April 1983) have submitted evidence to date, and further evidence is being prepared by the British Library.

Although it is not appropriate here to report in general on the map libraries

which the government departments themselves maintain, the mapping activities of the Directorate of Overseas Surveys gives this agency's collections an international significance. I therefore include as an appendix a report from C.I.M. O'Brien of the Directorate of Overseas Surveys.

Directories and guides

I will conclude with a brief report on two other cooperative projects. First, a Directory of UK Map Collections has been compiled by the Map Curators' Group of the British Cartographic Society and is now ready for the press. Secondly, an Historians' Guide to British Maps preserved in collections in the United Kingdom is being prepared for publication by the Royal Historical Society, with the help of a grant from the British Library. The work of compilation is under the editorship of Sarah Tyacke and Helen Wallis of the Map Library (British Library) with help from Peter Penfold (lately of the Public Record Office) and a committee of contributors.

Appendix 1

Contents of the Map Record in MAPLIB

<u>Attributes</u>	<u>Description</u>	<u>Example</u>
NUMBER	Map serial number	352
COPY	Copy number	1
COPIES	Total number of copies	20 (i.e. set of 20)
STATUS	Status code	1 (i.e. in stock)
LOCATION	Geographical location (UDC code - up to three may be entered)	430.160 (i.e. Bayern)
SCALE	Scale (representative fraction)	250000
SUBJECT	Subject of map (up to 3 entries)	38 59 8 (i.e. roads/tourist/topo)
FORMAT	Format of map	2 (i.e. flat)
DATE	Date of publication	1970
LATEST	Latest date of information	-1968 (i.e. approx. 1968)
PUBLISHER	Publisher	87 (i.e. Bartholomew)
PLACE	Place of publication	430.221 (i.e. Berlin)
LANGUAGE	Language of map (up to 3 entries)	1 5 (i.e. English/French)
EDITION	Edition note	3
SERIES	Series code	20 (i.e. Michelin 200000)
PROJECTION	Projection code	1 (i.e. Lambert conformal)
PRIMERIDIAN	Prime meridian of lat/long grid	0 E (i.e. 0°E of Greenwich)
LATLONG	Lat/long map 'window'	35 0 N 7 30 W 57 30 N 40 0 W
NATGRID	National Grid map 'window'	TQ 636 479 TQ 657 583
TITLE	Map title	Tourist map of Dartmoor
NOTES	Written notes	45x56 cm. Inset-Taiwan
SHELFMARK	Shelfmark	-----

- Note: (i) All entries are searchable except for Title, Notes and Shelfmark.
(ii) We do not store a shelfmark at the Middlesex Polytechnic.

Appendix 2

Report on the Directorate of Overseas Surveys by C.I.M. O'Brien

The Directorate of Overseas Surveys was founded in 1946 (as the Directorate of Colonial Surveys) as a central survey organisation to map the (then) dependent territories of the Commonwealth. It has continued to provide survey and mapping services to these territories after they gained independence as well as to some other developing countries as a part of the British overseas aid programme. As an adjunct to these activities it has developed specialised technical libraries holding survey data air photographs and maps of the countries for which it has worked. The map library has comprehensive holdings of topographic mapping produced both by the Directorate and by organizations within the countries concerned. It has more limited holdings of thematic maps. Most of these holdings relate to countries in Africa, the Caribbean, Southern Arabia, the Far East or the Pacific. Although primarily a working library serving the needs of its staff and those of other agencies, public and private, involved in overseas development activities, the map library may be used by other researchers by prior arrangement. It is currently situated at the Directorate headquarters at Tolworth but following the merger of DOS with the Ordnance Survey in April 1984 these technical libraries will be relocated in the latter's headquarters building at Maybush, Southampton as part of the Overseas Directorate that is to be formed there.

ACKNOWLEDGEMENTS

I extend my grateful thanks to the following who contributed to this report: Graham Lea, Director of GEOSYSTEMS, C.I.M. O'Brien of the Directorate of Overseas Surveys, Ifan D.H. Shepherd of Middlesex Polytechnic on MAPLIB, Sarah Tyacke, Map Library, British Library, Graham Webster, MCE(RE), Ministry of Defence.

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par

H. F. Alfred C O R D O L I A N I

Directeur de la

Bibliothèque médicale du Val-de-Grâce

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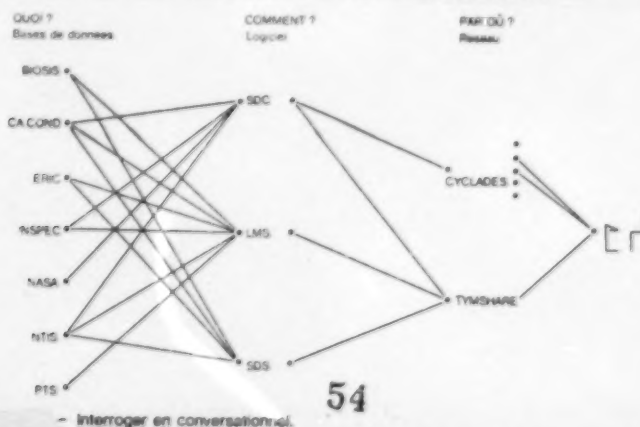


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- Un transporteur, qui est appelé réseau de transmission, et qui a pour fonction d'effectuer le transfert physique des informations entre l'ordinateur dont la mémoire contient en stock la base ou banque de donnée, et l'utilisateur; la part des réseaux privés est encore très largement dominante, mais des réseaux scientifiques publics se développent à diverses échelles;
- Un utilisateur enfin, qui peut être consommateur direct de l'information scientifique et technique (ingénieurs et techniciens, chercheurs, enseignants et étudiants), ou organe de relais d'information, tels les bibliothèques et les centres de documentations.

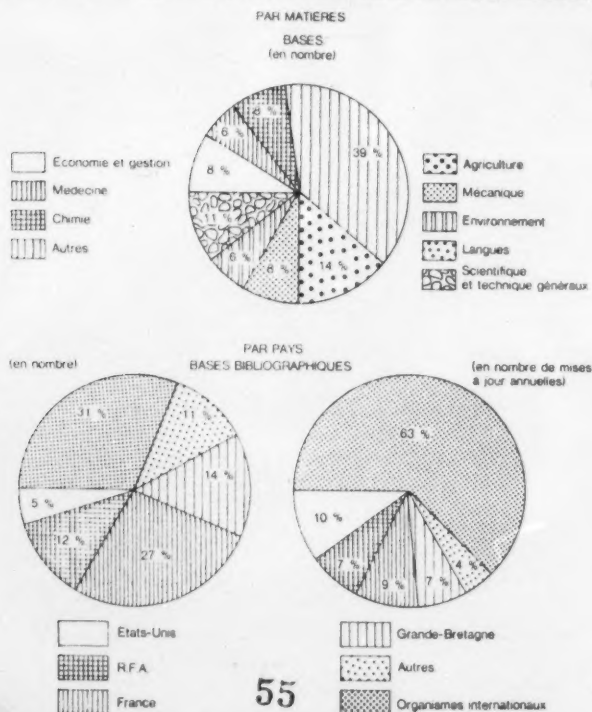


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2. Le nombre total des bases et des banques de données accessibles en Europe était, début 1979, de l'ordre de 400, dont 250 bases et 150 banques. Ce volume correspond à environ 10 millions de références par an pour les seules bases bibliographiques; l'ensemble des informations stockées représente un nombre total d'environ 10^{11} caractères, soit l'équivalent d'une dizaine de milliers de bandes magnétiques. L'importance respective des divers domaines diffère; le domaine médical en représente 6%, mais un nombre important de bases, classées dans les autres bases pour 39%, intéresse aussi la médecine et la biologie. La répartition par pays producteur montre l'importance des Etats-Unis (31%) et de la Grande-Bretagne (27%). Ces proportions sont encore accrues dans le domaine biomédical.

Tel est le tableau d'ensemble qui figure dans le rapport Nora-Minc(1)

Mais la situation est en train d'évoluer dans le sens d'un poids plus grand de l'Europe. La Commission des Communautés européennes a présenté fin novembre 1979, au conseil des chefs de gouvernement de Dublin, des propositions concrètes sur la future stratégie télématique de l'Europe en vue d'atteindre les objectifs suivants en 1990: acquérir 30% du marché mondial des télécommunications et de même pour le marché mondial des ordinateurs et pour le marché des composants électroniques; fournir le tiers des besoins en banques et bases de données. D'ici à 1985, 500 nouvelles bases et banques de données (petites et moyennes), ne doublant en rien les services américains, devraient être créées.



L'invitation commerciale à créer des bases et des banques de données rencontre d'ailleurs le souhait du politique à pouvoir disposer de façon aisée de l'ensemble des connaissances humaines accumulées.

Ainsi le nombre des bases et banques de données accessibles en Europe au milieu de 1982 était passé à 1026, dont 56% produites par les Etats-Unis et 26% par les Etats membres de la Communauté européenne: ces dernières étaient au nombre de 265, dont certaines particulièrement riches, comme COMEXT avec plus de 3 millions de références (sur le commerce extérieur de la Communauté).

Une série de trois tableaux établis par Monsieur Serge LUSTAC, fonctionnaire à la Direction générale pour l'information de la Communauté et reproduits en note montre que les Etats-Unis produisent encore 3,5 fois plus de références bibliographiques que la Communauté tandis que la dimension des bases de données européennes représente environ 40% de celle des bases de données américaines, mais que le nombre de banques de données factuelles est à peu près le même en Europe et aux Etats-Unis (2)

3. La situation des bases de données utilisées dans le domaine biomédical offre un certain nombre de particularités:

Ces bases sont pour la plupart déjà anciennes et remontent à plus de 10 ans: la recherche documentaire automatisée a trouvé ses premiers terrains dans les sciences biomédicales et la chimie;

Ces bases sont pour la plupart américaines; la puissance de la National Library of medicine et des organisations qui produisent les Chemical abstracts et Biosis est telle que, à l'exception des Excerpta medica, aucune organisation européenne n'a jugé opportun ni utile de créer des bases de données concurrentes;

Ces bases sont très fiables en raison de la haute qualité des Thesauri utilisés, spécialement le MESH, et malgré la multiplication croissante des publications biomédicales qui réduisent la valeur proportionnelle des fonds documentaires analysés.

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Le tableau ci après donne les caractéristiques essentielles de ces bases, en y incluant les bases pluridisciplinaires régulièrement interrogées dans la recherche biomédicale (PASCAL, SSIE, et SCI)

BASES	ORGANISME PRODUCTEUR	LANGAGE D'INTERROGATION	SERVEUR	LOGICIEL	RESEAU
BIOSIS (Biosciences information service)	Biological Abstracts		ASE, BRS, LMS, SDC	RECON, STARS, DIALOG, ORBIT	ESANET, TRANSPAC-ESANET, TYMNET-ESANET, PTT intern, TYMNET-TELENET
CANCERLINE (Cancer information on line) CLINPROT (Clinical Cancer Protocols) CANCERLIT (Cancer literature) CANCERPROJ (Cancer Projects)	National Library of Medicine	Naturel	NLM	ELHILL 3	PTT intern - TYMNET
CANCERNET (ex Sator)	Institut Gustave-Roussy	Thésaurus et naturel	TELESYSTEMES	MISTRAL	
CATLINE (Catalog on line)	National Library of Medicine	MeSH (Medical Subject Headings) et naturel	NLM	ELHILL 3	PTT intern - TYMNET
CHEMICAL ABSTRACTS	American Chemical Society	Naturel	ASE, BRS, LMS, SDC	RECON, STARS, DIALOG, ORBIT	ESANET, TRANSPAC-ESANET, TYMNET-ESANET, PTT intern-TYMNET, PTT intern-TELENET
CHEMLINE (Chemical dictionary on line)	National Library of Medicine	Fiches-dictionnaire	NLM	ELHILL 3	PTT intern - TYMNET
EXCERPTA MEDICA	Excerpta Medica Foundation	Liste de vocabulaire contrôlé: MAUMET (Master List of Medical Terms) et naturel	LMS	DIALOG	PTT intern-TYMNET, PTT intern-TELENET
MEDLINE (Medical literature analysis and retrieval system on line)	National Library of Medicine	Thésaurus et MeSH (Medical Subject Headings)	NLM	ELHILL 3	PTT intern
PASCALINE (Pascal on line)	CNRS	Naturel	ASE, TELESYSTEMES	RECON, MISTRAL	ESANET, TRANSPAC-ESANET, TYMNET-ESANET, TRANSPAC
PHARMACEUTICAL NEWS INDEX	DATA Courier		LMS, SDC	DIALOG, ORBIT	PTT intern-TYMNET, PTT intern-TELENET
RTECS (Registry of toxic effects of chemical substances)	National Library of Medicine	Naturel et liste de mots-clés	NLM	ELHILL 3	PTT international
RINGDOC	Deverent Publications	Naturel	SDC	ORBIT	PTT intern-TYMNET, PTT intern-TELENET
SCIENCE CITATION INDEX SEARCH	Institute for Scientific Information	Naturel	LMS	DIALOG	PTT intern-TYMNET, PTT intern-TELENET
SMITHSONIAN SCIENCE INFORMATION EXCHANGE	Smithsonian Institution	Vocabulaire contrôlé	LMS, SDC	DIALOG, ORBIT	PTT intern-TYMNET, PTT intern-TELENET
TOXLINE (Toxicology information on line)	National Library of Medicine	Naturel	NLM	ELHILL 3	PTT intern - TYMNET

4. Les réseaux utilisés pour l'interrogation de ces bases ont été longtemps et restent dans beaucoup de cas :

nationaux ou régionaux (CYCLADES puis TRANSPAC en France, SCANNET pour les pays scandinaves) transatlantiques (TELENET, TYMNET, DATAPAC).

Des liaisons ont été établies entre eux et en France par exemple depuis décembre 1978, un noeud de transit international (N T I) a été mis en place par la Direction générale des télécommunications, qui permet d'étendre le service de transmission de données TRANSPAC à l'international.

5. Cette phase est maintenant dépassée en Europe et un réseau communautaire s'est mis en place.

Créé par la Commission des Communautés européennes au cours des deux dernières années, le réseau EURONET-DIANE réunit les partenaires suivants :

- 23 serveurs européens d'information et de documentation qui offrent l'accès en conversationnel à des bases de données économiques, sociales, scientifiques et techniques; ensemble, ils constituent DIANE, le réseau européen d'accès direct à l'information;
- les administrations des télécommunications (PTT) de la Communauté européenne, qui exploitent le réseau de télécommunication international EURONET reliant les neufs pays membres de la Communauté;
- la Commission des Communautés européennes, qui appuie le projet et les services communs offerts aux utilisateurs.

Le réseau proprement dit fonctionne de la manière suivante

Il comporte à Londres un centre de contrôle qui, comme son nom l'indique, veille au bon fonctionnement et à la gestion de l'ensemble. A Francfort, à Paris, à Rome et également à Londres se trouvent des noeuds de commutation équipés d'ordinateurs reliés entre eux par des connections à haute performancendoublées pour faire face à l'éventualité d'une panne. Les "ordinateurs hôtes" et les terminaux utilisateurs ou "concentrateurs" d'Amsterdam, Bruxelles, Copenhague, Dublin et Luxembourg peuvent être reliés au noeud de commutation le plus proche. Si un abonné d'EURONET-DIANE se trouvant à Londres veut savoir quel type de recherche a été effectué récemment en France sur un sujet particulier, s'il veut connaître où il pourra exactement trouver les renseignements dont il a besoin, il lui suffit de décrocher son téléphone. Le concentrateur transmet sa demande au noeud de commutation qui la transmet à son tour aux ordinateurs hôtes reliés au réseau. Ces "hôtes" peuvent être soit des bases, soit des banques de données;

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Deux nouveaux partenaires sont entrés dans le réseau, qui élargissent celui-ci au delà des frontières de la Communauté économique européenne: La Suisse en 1980, la Suède en 1982.

Des services communs ont en outre été développés, au service des utilisateurs futurs:

le langage common command qui est disponible sur les logiciels DIRS 3 utilisés par les serveurs DIMDI, ECHO, FIZ-technik, INKA et sur celui d'IRS; il est en cours de réalisation sur MISTRAL, STAIRS et UNIVAC et prévu ultérieurement sur GOLEM;

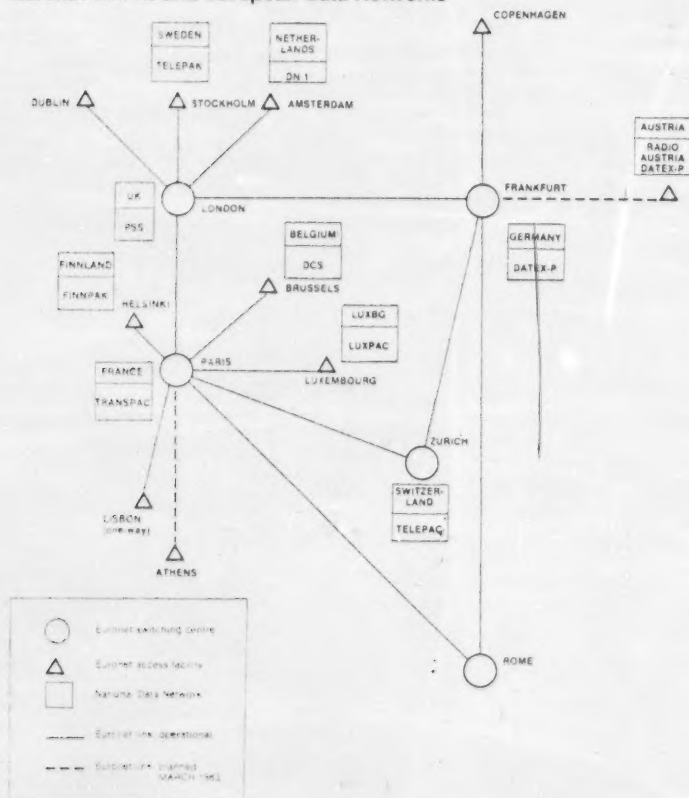
Un centre automatisé de renseignements accessible en ligne gratuitement sur EURONET (Adresse réseau: 0234307813 DN);

des outlis multilingues;

un forum central des utilisateurs EURONET;

l'équipe de lancement d'EURONET/DIANE, plurilingue, qui est à la disposition des utilisateurs pour leur porter assistance, si nécessaire.

Euronet DIANE and European Data Networks



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6. En même temps les services de télécommunications établissaient dans chaque pays un réseau couvrant le territoire national et indépendant de la commutation téléphonique habituelle: par exemple TRANSPAC en France, BRITISH national packet switched service -PSS au Royaume Unis. Ces réseaux de transmission par paquets offrent à l'utilisateur les conditions les plus intéressantes puisque, connectés au réseau EURONET, ils permettent d'abolir la notion de distance dans la facturation: le prix est le même quelle que soit la distance entre l'utilisateur et la base de données interrogée.

Sur le plan pratique l'utilisateur doit demander d'abord l'accord de la base de données qu'il désire interroger et souscrire aux conditions de celle-ci s'il en existe, puis se mettre en rapport avec l'administration des télécommunications de son pays pour obtenir un mot de passe NUI.

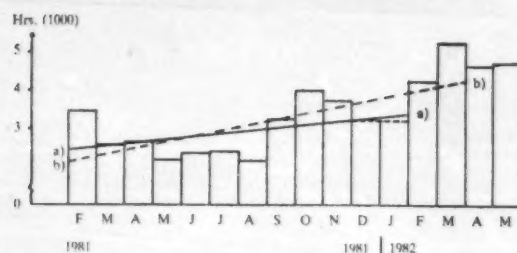
La redevance couvre les frais de rattachement au réseau spécifique national et les frais de connexion avec le serveur choisi.

Une comparaison entre les coûts d'EURONET et ceux qui sont pratiqués aux États-Unis montre les résultats suivants

	Volume (64 kbytes) (\$)	Connect- Time = 1 hr (\$)
<i>Europe</i>		
- EURONET internal rates	2.30	2.70
- TELENET internal rates	0.30	1.40 - 4.80
<i>Transatlantic</i>		
- UK-US (via IPSS)	8.00	12.00
- US-UK (via TELENET)	12.00	10.00

7. Les premières statistiques sur l'utilisation du réseau EURONET pendant une année entière montre une croissance continue à la fois du nombre des usagers reliés au réseau et du nombre d'heures d'interrogation en conversationnel. 2500 possesseurs de mots de passe sont maintenant connectés au réseau, soit directement soit par l'intermédiaire des réseaux spécifiques nationaux, alors que le nombre était seulement de 700 en juin 1980. Pour l'année 1981 35330 heures d'interrogation ont été décomptées, avec un sommet en octobre et novembre (4000 heures) et un creux en mai et en août (2000 heures).

Les deux pays les plus actifs sur le réseau sont le Royaume Uni et la France, directement suivis par les Pays-Bas (de 190 à 150 interrogations par jour), tandis que l'Italie est le pays qui utilise le mieux le réseau (entre 35 et 42% du trafic international des télécommunications).



Compiled by E. Wetzel, DIANE Launch Team, Lshg.

(extrait de EURONET - DIANE news, n°27, juillet - août 1982)

8. Le réseau EURONET a marqué pour la recherche documentaire biomédicale automatisée en Europe, un progrès sensible car tous les serveurs donnant accès aux bases de données biomédicales se sont connectés au réseau:

BLAISE au Royaume Uni, DATASTAR, DIMDI en république fédérale allemande
DOKDI en Suisse, INFOLINE/PERGAMON, IRS/ASE, QUESTEL en France.

En conséquence peuvent être interrogées directement:

les bases de la NLM (par DATASTAR et DIMDI),

les autres bases biomédicales (EMBASE, CANCERNET, PSYCHINFO, RINGDOC etc),

les bases biologiques et chimiques utiles aux chercheurs biomédicaux (BIOSIS, CHEMABS, CASEARCH),

les bases pluridisciplinaires dans le fonds documentaire desquelles les sciences de la vie tiennent une place importante (PASCAL, INIS, CIS, etc),

enfin: les bases spécifiques à des types de documents (CPI pour les congrès, INP et IMPADOC pour les brevets, SCI pour la généalogie d'auteurs etc):

Il importe cependant de préciser que les réseaux régionaux préexistants et de nature privée: ESANET et SCANNET conservent leur existence autonome, bien qu'ayant passé des accords de coopération avec EURONET et que dès lors les interrogations peuvent continuer à être faites notamment par le serveur IRS/ASE pour toutes les bases membres du réseau ESANET.

9. On sait que la technologie qui associe maintenant la télévision et les transmissions permet de composer, à partir de données d'information à transmettre, de véritables pages de périodiques ou de livres dans la forme nécessaire pour que ces pages soient introduites sur le réseau de télévision: c'est le télétext ou videotex. L'édition automatique correspond au cas où les données disponibles à diffuser se trouvent dans une base de données: un tel procédé permet l'édition de données demandées (références ou textes intégraux) par l'intermédiaire de programmes de mise en forme et de transcodage de type classique. Quiconque possède un récepteur de télévision muni d'un dispositif spécial verra sur l'écran les textes imprimés souhaités, dont on commandera l'apparition ou la disparition grâce à un clavier analogue à un calculateur de poche. Les systèmes opérationnels de ce genre sont: PRESTEL au Royaume-Uni, TELETEL en France, BILDSCHIRMTEXT en République fédérale allemande, CAPTAIN aux Etats-Unis. Les 26 pays membres de la Conférence européenne des postes et télécommunications se sont mis d'accord, à la fin de 1981, sur un standard pour la nouvelle génération de videotex, qui remplacera les trois spécifications actuelles et empruntera le meilleur de chacune d'elles.

Les terminaux construits selon ce nouveau standard seront aptes à recevoir les trois services actuels.

10. Dans l'état actuel, PRESTEL a été le premier en mesure de coopérer avec le réseau EURONET: les utilisateurs de PRESTEL habitant dans les pays membres de la Communauté européenne et en Suisse ont pu, dès le mois d'octobre 1981, utiliser le réseau EURONET au lieu des lignes téléphoniques internationales normales pour interroger une série de bases de données documentaires, réduisant ainsi les coûts de communication, de 80%.

Mais EURONET est employé, dans ce cas, seulement comme un moyen de communication entre un hôte et un terminal du système Videotex. Aussi convenait-il d'aller plus loin et de développer un logiciel qui permette aux terminaux videotex à clavier d'accéder aux bases de données et aux banques de données. Ceci exige une modification de présentation des informations au format Videotex (reformattage), pour un meilleur confort visuel, et une simplification des dialogues de consultation afin que l'accès soit permis aux non spécialistes.

Trois grands serveurs ont aujourd'hui fait l'effort nécessaire en ce sens: IRS/ESA/ASE (serveur de l'Agence spatiale européenne),

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Questel (serveur français), DIMDI (SERVEUR ALLEMAND BIOMEDICAL).
Aujourd'hui un nombre très important de bases de données sont ainsi
accessibles, représentant plus de 40 millions de références biblio-
graphiques.

11. Au plan de la France, le réseau TRANSPAC, connecté à EURONET, a
ouvert cette année 1500 accès de norme Videotex, il prévoit l'insta-
llation de 200000 terminaux à la fin de 1984.

La Direction générale des télécommunications met à la disposition
des intéressés trois types de terminaux Videotex interactifs autonomes,
dénominés MINITEL, qui comprennent chacun:

- un écran de visualisation cathodique noir et blanc,
 - un clavier,
 - un modem 1200/75 pour le raccordement au réseau téléphonique
- Les trois types offerts aux usagers sont:

une version de base avec tube 9 pouces fonctionnant avec un
poste téléphonique séparé,

une version à écran 12 pouces,

une version à poste téléphonique T 83 intégré et écran 9 pouces.

Chaque terminal est muni d'une prise péri informatique permettant
le raccordement d'un lecteur de cartes à mémoire ou magnétique, d'un
calculateur domestique, d'un appareil de recopie d'écran, d'une prise
péri-télévision pour la connexion d'un téléviseur couleur ou d'un
vidéodisque. Les services commerciaux de la D.G.T offrent en location
entretien, pour un abonnement mensuel de 70 FF, le terminal MINITEL TELIC,
qui permet l'accès à tous les services et bases de données répertoriés
dans un Videotex guide (annuaire des services accessibles édité fin
1982, et mis à jour trois fois par an).

Les bases de données biomédicales, ou les bases de données spéci-
fiques à tel type de publications qui complètent nécessairement les
premières, sont les suivantes, dans l'ordre alphabétique:

- BIOSIS (63 UC 1'heure de connexion au 1-1-1983)(3)
- CAB (sciences agricoles y compris la médecine vétérinaire)
- CANCERNET (300 FF)
- CHEMABS (60 UC)
- CONFERENCE PAPERS INDEX (congrès, 68 UC)
- ENERGYLINE (source d'énergie et effets sur la santé)(73 UC)
- ENVIROLINE (73 UC)
- EURECAS (350 FF)

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FRANCIS (pour la base de données RHESUS, économie de la santé)(290 FF)

FSTA (alimentation et nutrition)(54 UC)

HSELINE (santé et hygiène du travail)(55 UC)

INIS (énergie nucléaire)(68 UC)

INPI (brevets)(500 FF)

MEETING AGENDA (annonce des congrès)(450 FF)

NASA (40 UC)

NORIANE (normes, 550 FF)

NTIS (recherche des agences fédérales américaines)(47 UC)

PASCAL (pluridisciplinaire en sciences et techniques, 48 UC)

POLLUTION (68 UC)

WORLD TRANSINDEX (traductions, 63 UC).

12. Cette liste et les facilités d'accès à faible coût que procure maintenant la technique Videotex montrent à quel point de développement est arrivée la recherche documentaire automatisée dans les sciences biomédicales. Le succès et l'expansion du réseau EURONET placent les pays francophones dans une situation aussi bonne aujourd'hui que les pays anglo saxon et on ne peut que s'en réjouir pour la promotion de la recherche biomédicale en particulier.

Reste aux chercheurs, et aux médecins en général; à s'adapter rapidement aux facilités que leur apporte le progrès technologique.

Il convient toutefois de remarquer que deux lacunes très importantes existent dans la liste ci-dessus: ni les bases de la NLM ni les excepta medica (EMBASE) ne peuvent être interrogées avec la technique Videotex sur MINITEL. Mais la République fédérale allemande connaît une situation bien plus favorable avec le serveur DIMDI, qui offre l'accès à toutes les bases de données biomédicales avec la technique BILDSCHIRMTEXT (Videotex). Cela montre que la coopération étroite réalisée grâce au réseau EURONET au niveau de l'Europe n'a pas encore atteint ses possibilités maximales et que des pas importants restent à faire dans l'un ou l'autre des pays de la Communauté européenne... Sans oublier l'adaptation constante à un progrès technologique rapide et les perspectives qu'ouvrira bientôt l'écran sensible.

1. L'ouvrage fondamental à lire sur la situation présente est le rapport de MM.SIMON NORA et ALAIN MINC:

Informatisation (L') de la société. Rapport au Président de la République. Paris, documentation française, 1978, 5 volumes.

Le rapport proprement dit occupe le volume 1, et les volumes 2 à 4 sont des rapports techniques sur différents problèmes posés par l'évolution technologique; le deuxième est particulièrement important en raison de l'étude de M.RAIMUNDO BECA sur les banques de données (bases et banques factuelles): données scientifiques, techniques et économiques, fonds documentaires.

Mais le travail remonte maintenant à près de cinq années.

2.

Table 1: Distribution of unique databases produced by all categories of producers, according to origin of producers by type of databases

Origin of producers	Type of databases					All categories of data bases
	Textual		numerical			
	biblio.	factual	mixed text/ num.	time series	other numeric	
USA	155	83	105	140	87	570
EEC (CEC included)	113	71	21	29	30	264
Rest of the world	69	27	6	27	31	160
International organisations (CEC excluded)	8	3	2	16	3	32
All origins	345	184	134	212	151	1026

Table 2: Distribution of bibliographic records produced according to origin of producers by category of producers (X 1.000.000 records)

Origin of producers	private database producers	public or non profit database producers	all categories of producers
USA	33.2	41.9	75.1
EEC (CEC included)	4.9	16.3	21.2
Rest of the world	0.8	6.2	7.0
International organisations (CEC excluded)	—	1.5	1.5
All origins	38.9	65.9	104.8

(with L & M Table 3

(with link 2)

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Table 3: Distribution of time-series produced according to origin of producers by category of producers
(X 1.000.000 series)

Origin of producers	private database producers	public or non profit database producers	all categories of producers
USA	1.8	4.5	6.3
EEC (CEC included)	0.2	4.2	4.4
Rest of the world	0.1	0.5	0.6
International organisations	---	2.9	2.9
All origins	2.1	12.1	14.2

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(reproduits d'après EURONET-DIANE, news, n° 27, juillet/août 1982)

(3) L'unité de compte (UC) vaut 6,03 FF